

In the Claims:

Please cancel claims 1-41.

The remaining claims 42-50.

42. A method of making a magnetic head assembly that includes a write head and a read head comprising the unordered steps of:
- making the write head as follows;
- forming first and second pole piece layer with each of the fist and second pole piece layers having a yoke portion located between the pole tip portion and a back gap portion;
- forming a nonmagnetic write gap layer between the pole tip portions of the first and second pole piece layers;
- forming an insulation stack with at least one coil layer embedded therein between the yoke portions of the first and second pole piece layers; and
- connecting the first and second pole piece layers at their back gaps portions; and
- making the read head as follows:
- forming a spin valve sensor between nonmagnetic nonconductive first and second read gap layers; and
- forming the first and second read gap layers between a ferromagnetic first shield layer and the first pole piece layer; and
- making the spin valve sensor as follows:
- forming nonmagnetic conductive first and second spacer layers;
- forming a ferromagnetic free layer structure between the first and second spacer layer that has a magnetic moment;
- forming an antiferromagnetic pinning layer;

forming a pinned layer structure between the first spacer layer and the pinning layer with a magnetic moment pinned by the pinning layer;

forming a nonmagnetic conductive specular reflector layer structure; and

forming a self-pinned layer between the second spacer layer and the specular reflector layer structure having a magnetic moment that can be pinned by sense current fields parallel to the magnetic moment of the pinned layer structure.

44. A method as claimed in claim 42 wherein the making of the read head further includes:

forming a ferromagnetic second shield layer; and

forming a nonmagnetic nonconductive separation layer between the second shield layer and the first pole piece layer.

42. A method as claimed in claim 42 including:

forming the specular reflector layer structure with a first specular reflector layer composed of copper (Cu) and a second specular layer composed of silver (Ag); and

forming the first specular reflector layer between and interfacing the second specular reflector layer and the self-pinned layer.

45. A method as claimed in claim 42 including:

forming the specular reflector layer structure with a first specular reflector layer composed of copper (Cu) and a second specular reflector layer composed of gold (Au);

and;

forming the first specular reflector layer between the second specular reflector layer and the self-pinned layer.

46. A method as claimed in claim 42 wherein the free layer structure is formed between the first gap layer and the pinning layer.

47. A method as claimed in claim 46 wherein the pinned layer structure is formed of an antiparallel (AP) pinned layer structure, the method of making the AP pinned layer structure comprising the unordered steps of:
forming ferromagnetic first and second antiparallel (AP) pinned layers; and
forming an aniparallel (AP) coupling layer between the first and second AP pinned layers.

48. A method as claimed in claim 46 wherein the pinned layer structure is formed of a ferromagnetic single pinned layer.

49. A method as claimed in claim 48 including:
forming the specular reflector layer structure with a first specular reflector layer composed of copper (Cu) and a second specular layer composed of silver (Ag); and
forming the first specular reflector layer between and interfacing the second specular reflector layer and the self-pinned layer.

50. A method as claimed in claim 49 wherein the self-pinned layer is formed with a thickness that is less than a thickness of the single self-pinned layer.